

Changing Color, Using Text Objects, and Random Selection in Alice

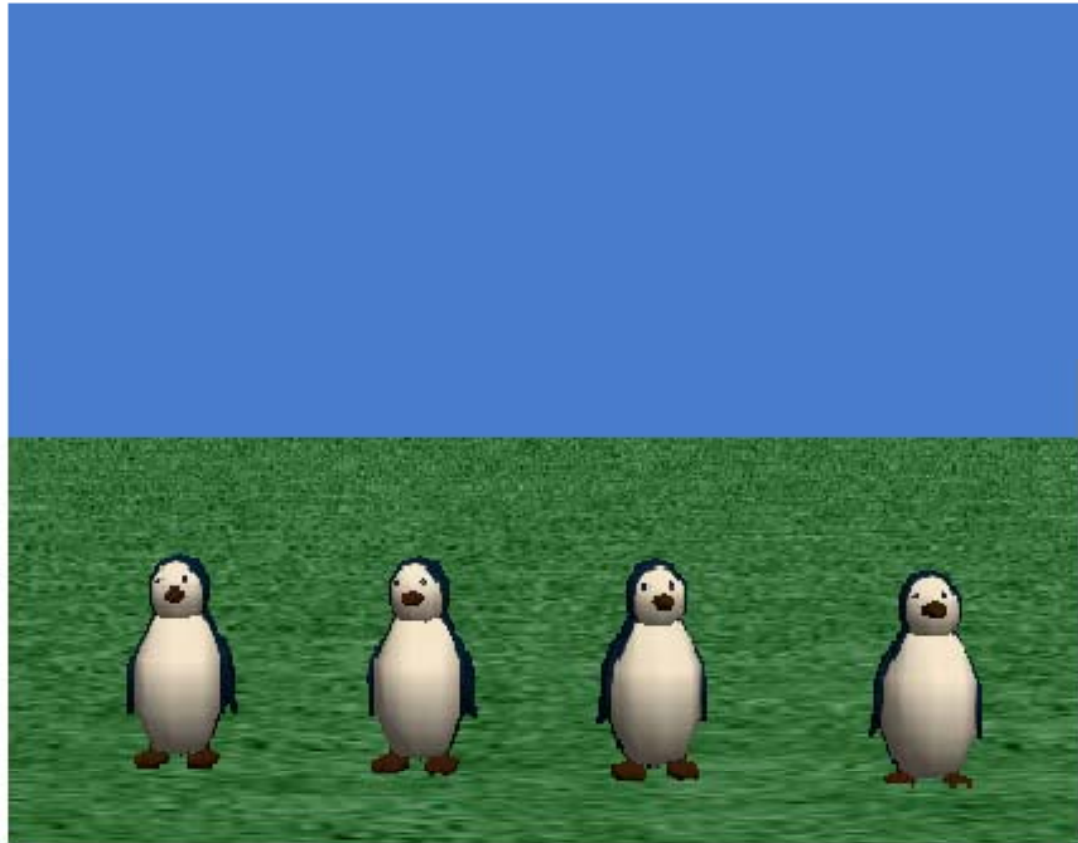
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Under the direction of Professor Susan
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Duke University, July 2008

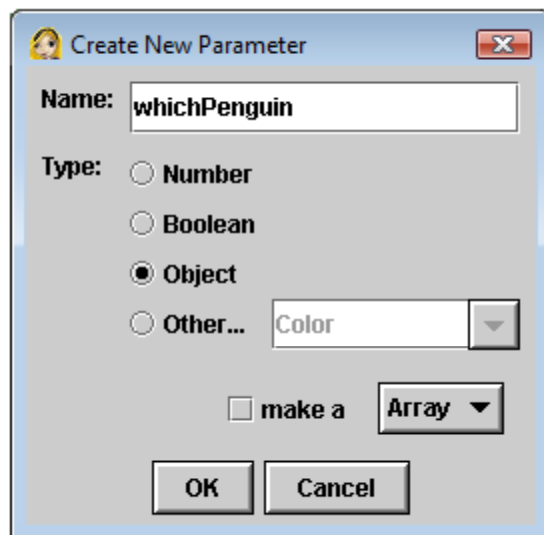


Download the starting world that goes with this tutorial. We are going to create a world in which each of the four penguins changes randomly to one of four colors. Then, after each penguin changes, a text object with their color on it will appear in the sky. For now, after you download your starting world, you should just see four penguins standing in a row.

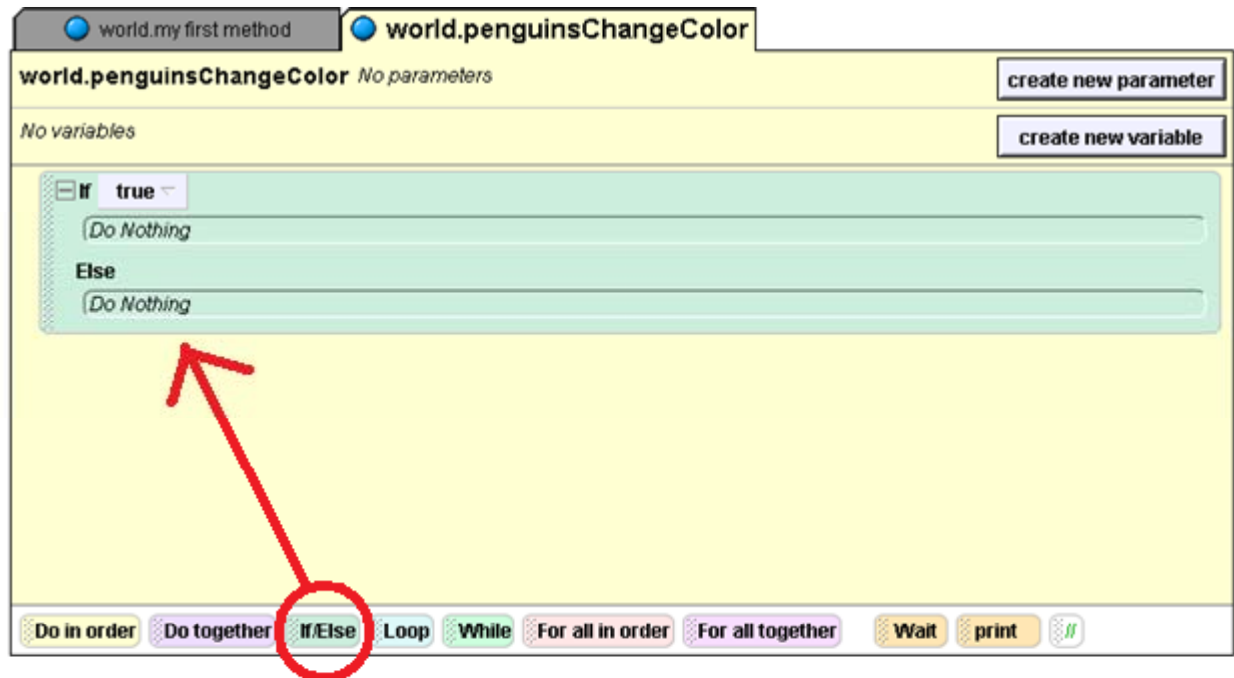


Step 1: Changing the Penguins' Colors

The first thing to do is to create a method that goes down the row of penguins, and changes their color one by one to a randomly selected color. Create a new world method called **penguinsChangeColor**. Give it an object parameter called **whichPenguin**.

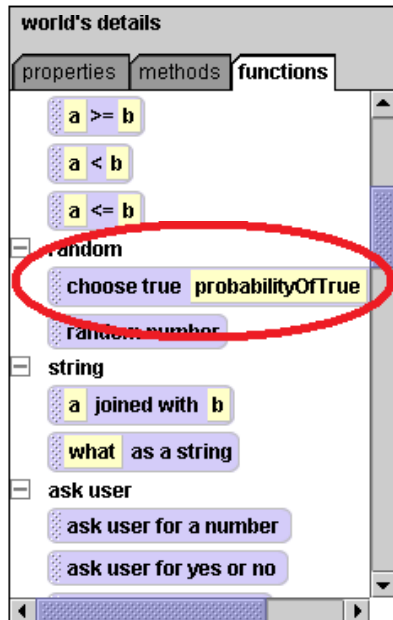


Drag an **If Else** statement into your method editor, and choose **true** on the menu that pops up. We will use this statement to choose colors for the penguins.

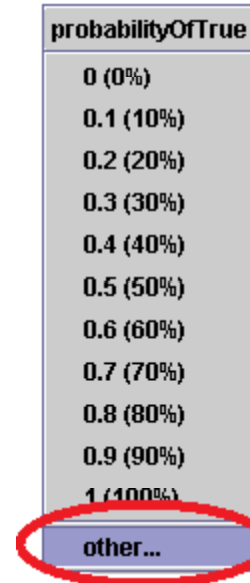


Step 1: cont.

-Click on **world** in your object tree, and then click on the **functions** tab.
-Scroll down until under **random** you see **choose true probabilityOfTrue of the time**. This button is a random generator. Depending on what you enter into the **probabilityOfTrue** space, when your world runs it will select **true** a certain percentage of the time, and it will select **false** a certain amount of the time.



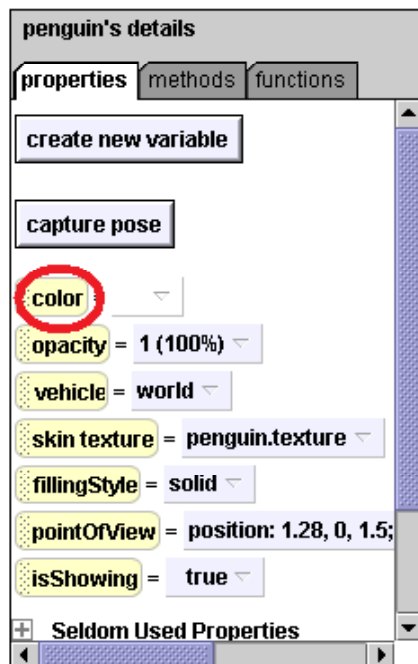
Drag this command into your method editor, and drop it over the **true** on your **If Else** statement. A menu will pop up with different percentages on it. Click on **other** and then enter in **.25** in the calculator.



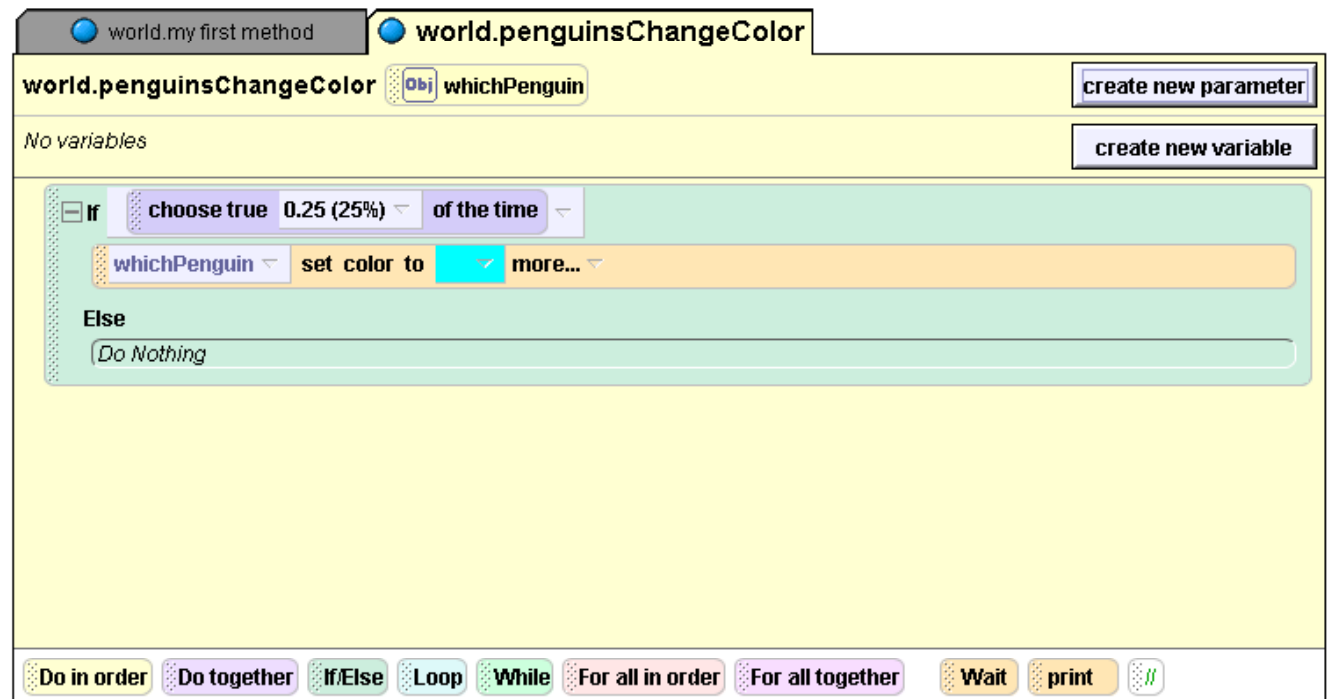
This means that each time your program runs, there is a **25%** chance that this random generator will select **true**, or about 1 in every 4 times.

Step 1: cont.

Now we'll actually work on changing the colors. Click on **penguin** in your object tree and then click on the **properties** tab. You should see a button that says **color**. Drag this button over the part of your **If Else** statement right under **If** where it now says **Do nothing**. Drop it there.



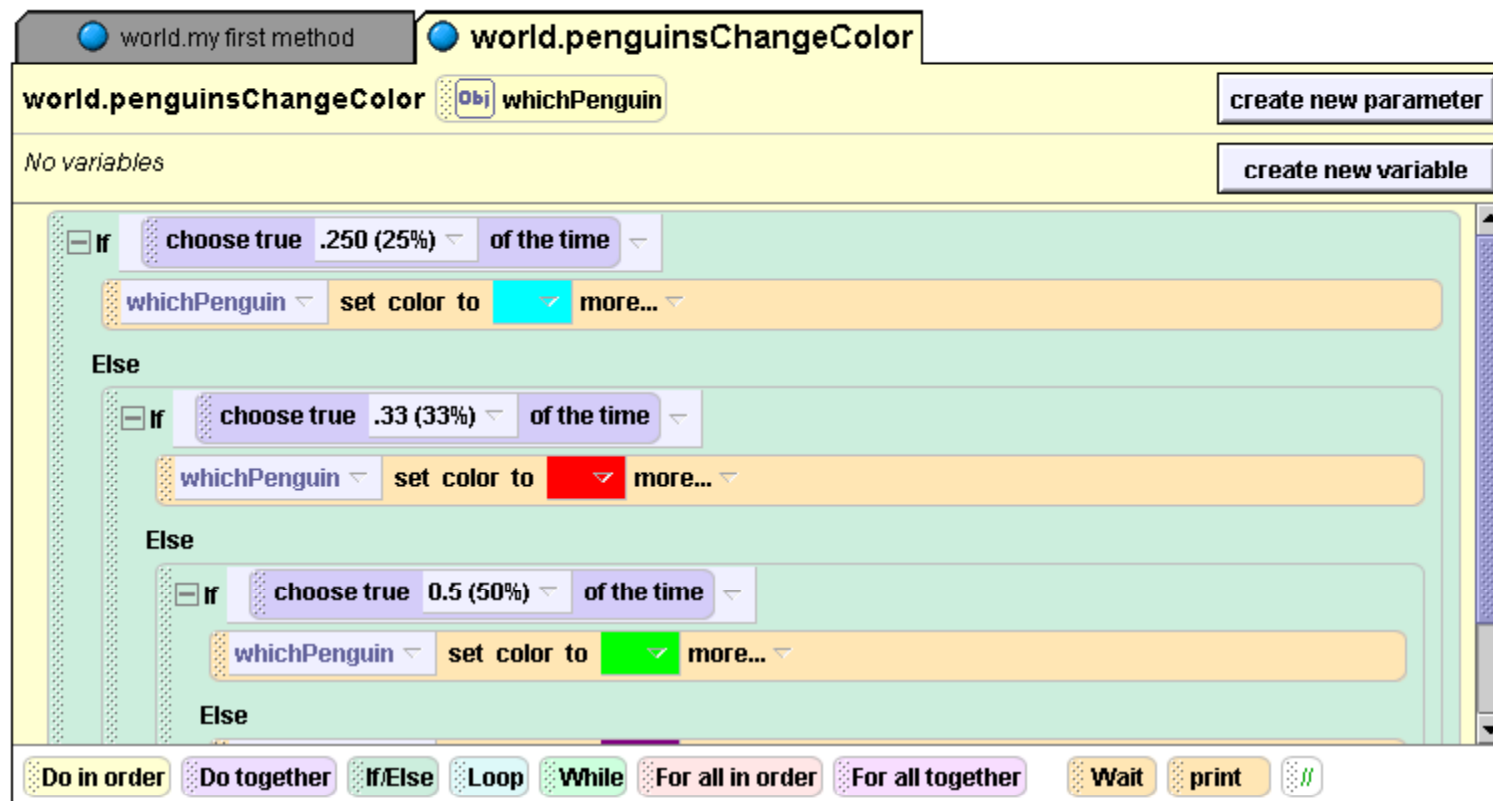
When you do this, a menu with lots of different colors will pop up. Click on **cyan**. Then, click on your **whichPenguin** parameter, and drag and drop it on top of the **penguin** part of your color command. Your method editor will look like this:



This command means that **If** the random generator selects **true**, whichever penguin you select for **which Penguin** will turn cyan. If it selects **false**, the **Else** part of the **If Else** will kick in, and nothing happens. At least not yet....

Step 1: cont.

Now we will tell the penguins what to do if the first random generator chooses **false**. Drag another **If Else** statement under the **Else** part of your first **If Else** statement. Then repeat all of the steps from your first **If Else** statement, this time setting the percentage at **33%** and selecting the color **red**. Repeat it again for the color **green**, this time setting the percentage at **50%**. Your code will look like this:

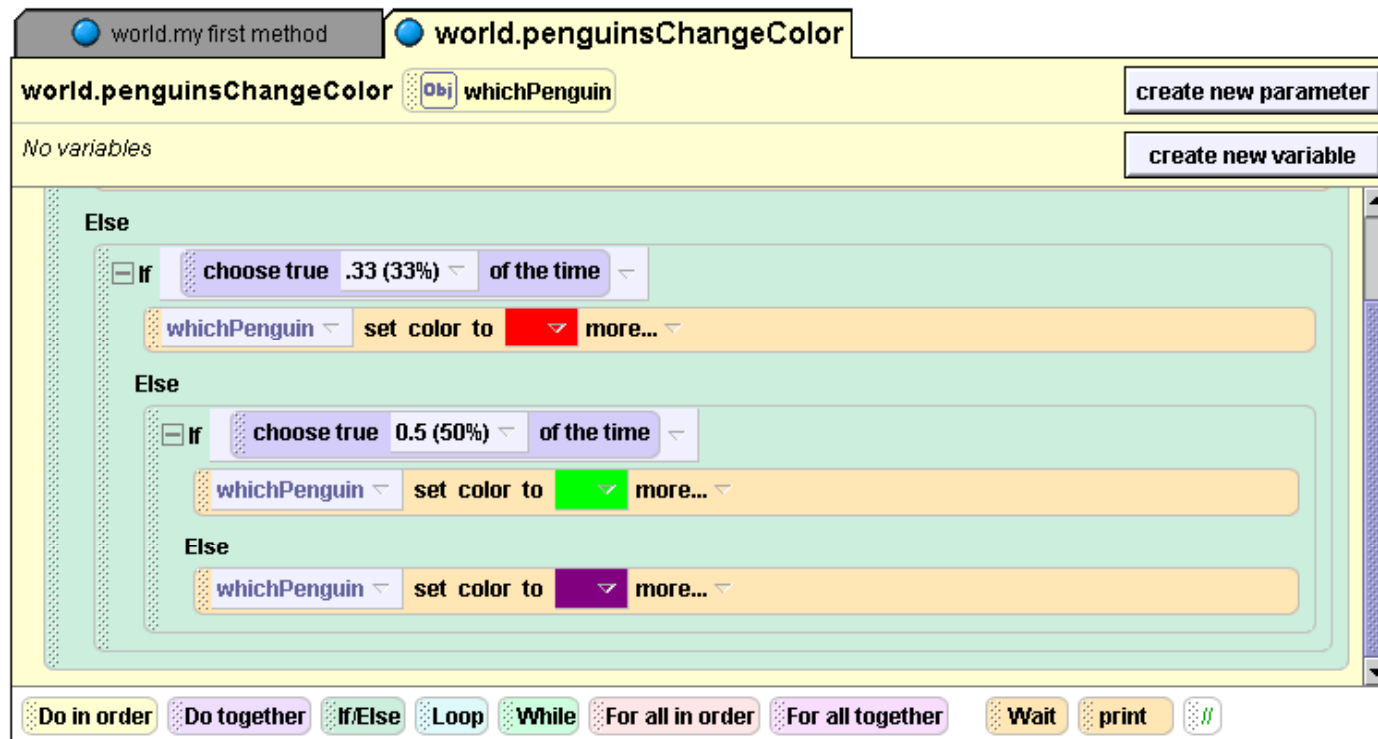


So if the first random generator chooses **false**, the second one will kick in. If the second one chooses **true**, the penguin will be turned red. If it chooses **false**, the third one will kick in, and turn the penguin green if **true** is chosen.


Step 1: cont.

Now to finish the method, place another **set color to** method under the **Else** part of the last **If Else** statement. Choose **purple** for this last color. It will look like this:

Now **penguinsChangeColor** is complete! Drag it into world.my First Method four times. For each of the four times, make **whichPenguin** a different penguin, starting with **penguin** and going to **penguin4**. Play your world. Your penguins should change color one after another. If you restart your world and play it again, the colors will be different. Don't be alarmed if two or more of your penguins are the same color. This is our random generator at work!




This is what your code should look like in **world.my first method**:

 world.my first method

world.my first method *No parameters* create new parameter

No variables create new variable

 Do in order

world.penguinsChangeColor whichPenguin = penguin ▾

world.penguinsChangeColor whichPenguin = penguin2 ▾

world.penguinsChangeColor whichPenguin = penguin3 ▾

world.penguinsChangeColor whichPenguin = penguin4 ▾

Do in order

Do together

If/Else

Loop


While

For all in order

For all together

Wait

print



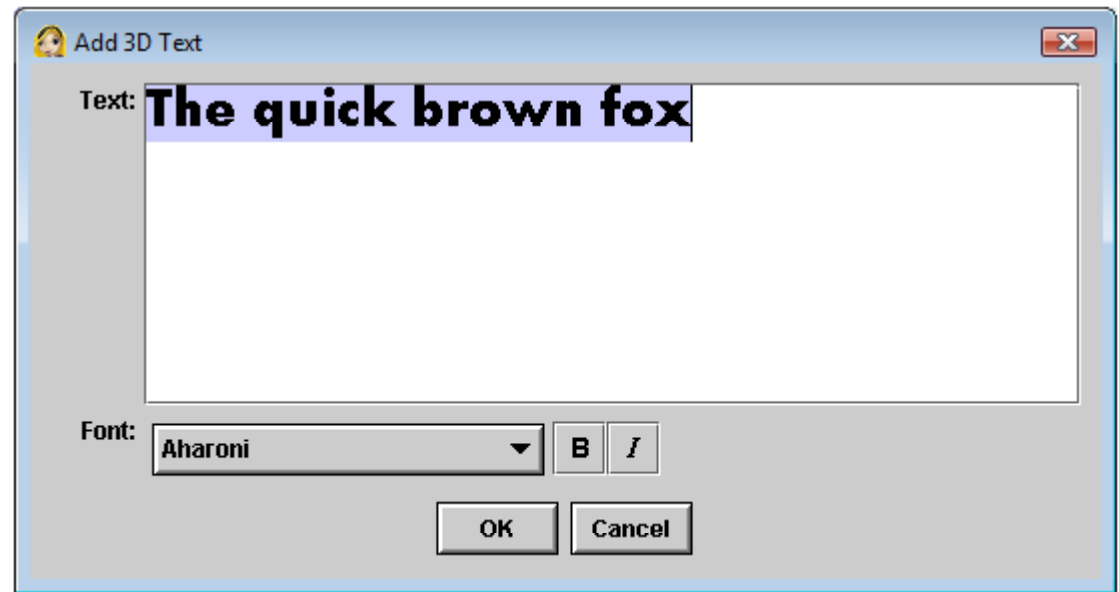
Step 2: Adding Text Objects

Now we're going to insert text objects into our world. We'll write a method that makes the correct color name appear when a penguin changes color, and disappear before the next penguin changes color. First we'll put the text objects into our world. Click the **add Objects** button, and scroll to the end of the objects folders. There you'll see this button:



Click on it.

A text editor will pop up. It looks like this:



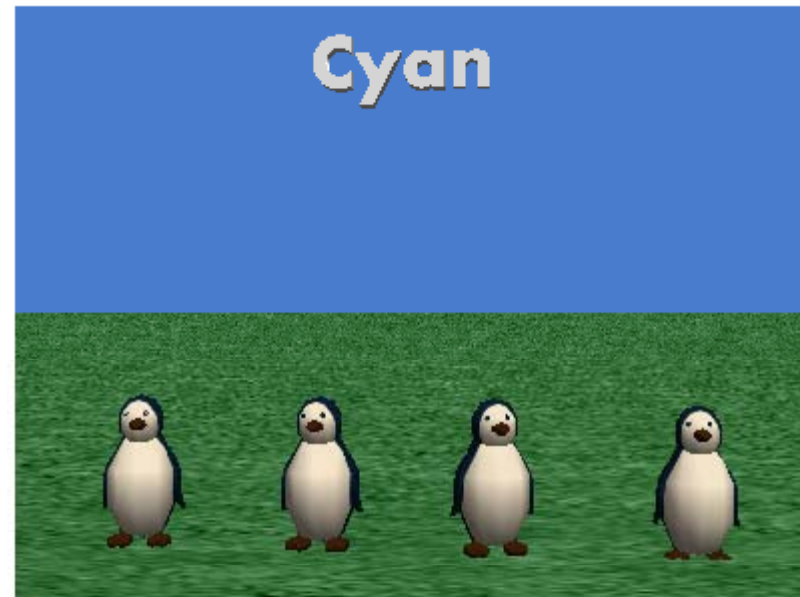
Type in the word **Cyan**. Click ok.

Step 2: cont.

Now the word **Cyan** will appear on your screen with your penguins. Move it further away from the camera and higher up in the sky with your buttons that are found on the screen after you press **add objects**. They look like this:

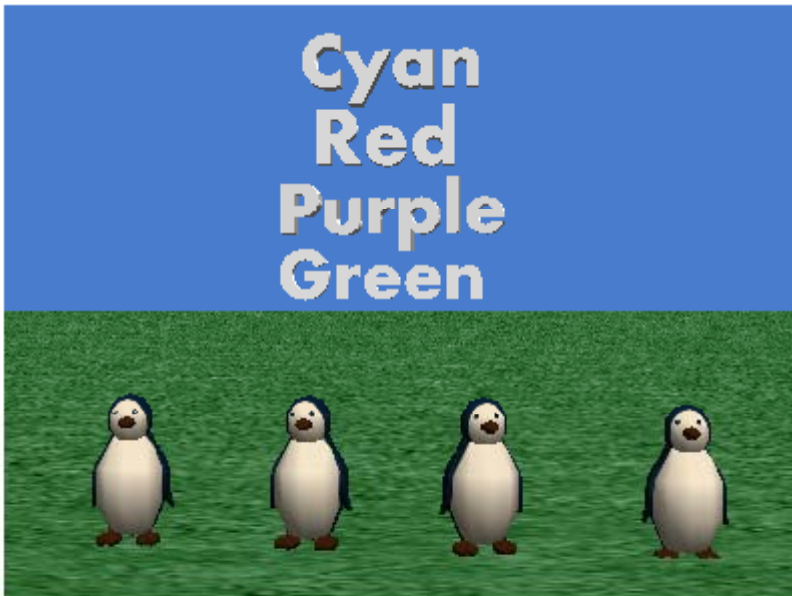


Move the word **Cyan** until it looks about this size in this position in the sky:

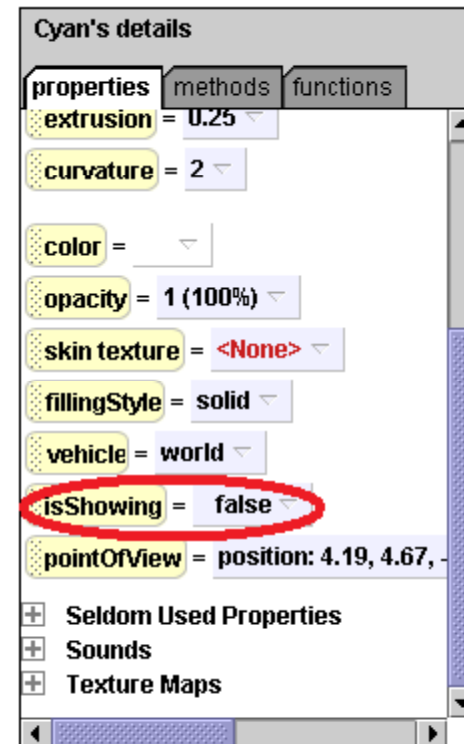


Step 2: cont.

Now, add three more text objects. The second one should be the word **Red**, the third should be the word **Purple**, and the fourth should be the word **Green**. Position the words in the sky of your Alice world so that they look like this:



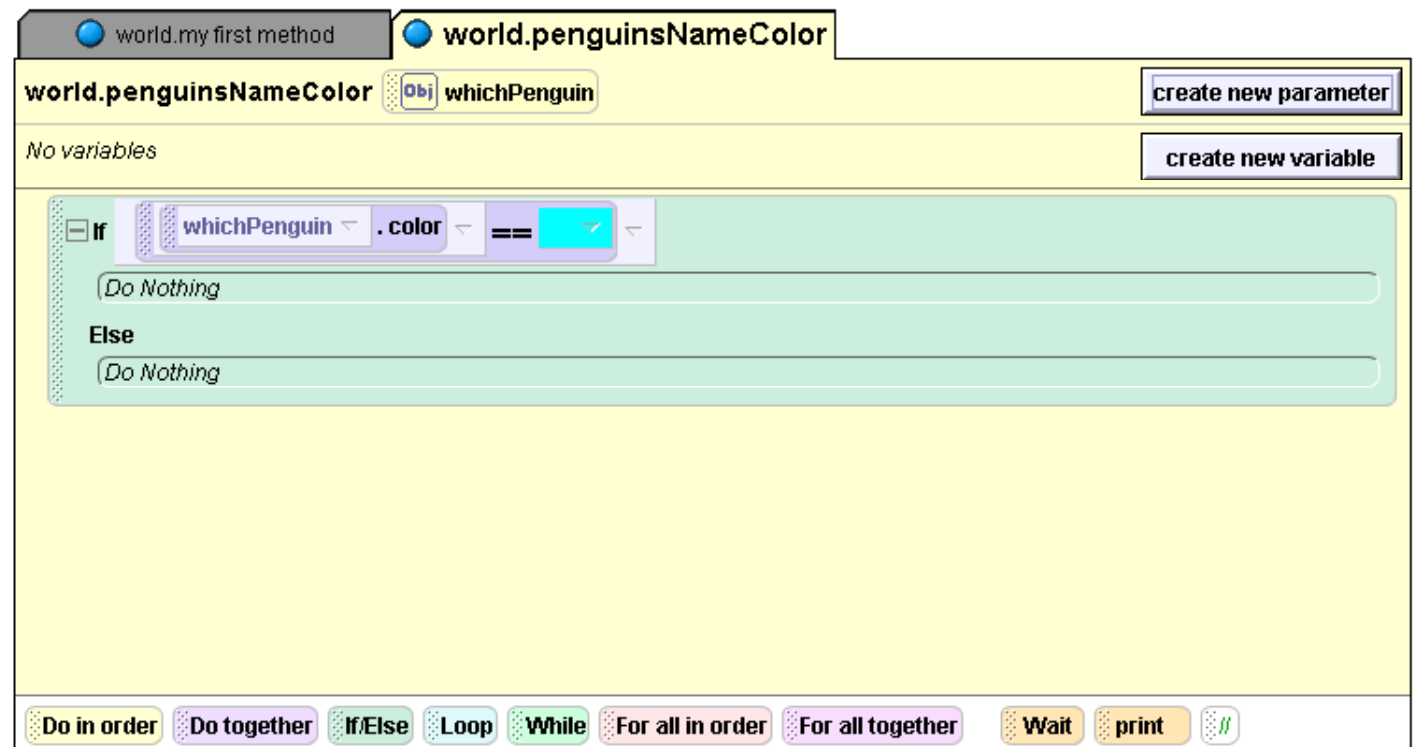
Now we are going to make all of the text objects invisible. Later, we will write a method that makes a word appear only when a penguin turns that color. Click on the word **Cyan** in your object tree on the left side of your screen. Then click on the **Properties** tab. Scroll down until you see the **isShowing** button. Change it from **true** to **false**. This will make the word **Cyan** disappear. It's still there, it's just invisible. Do this same thing to the other three words.



Step 3: Making the Text Boxes Appear

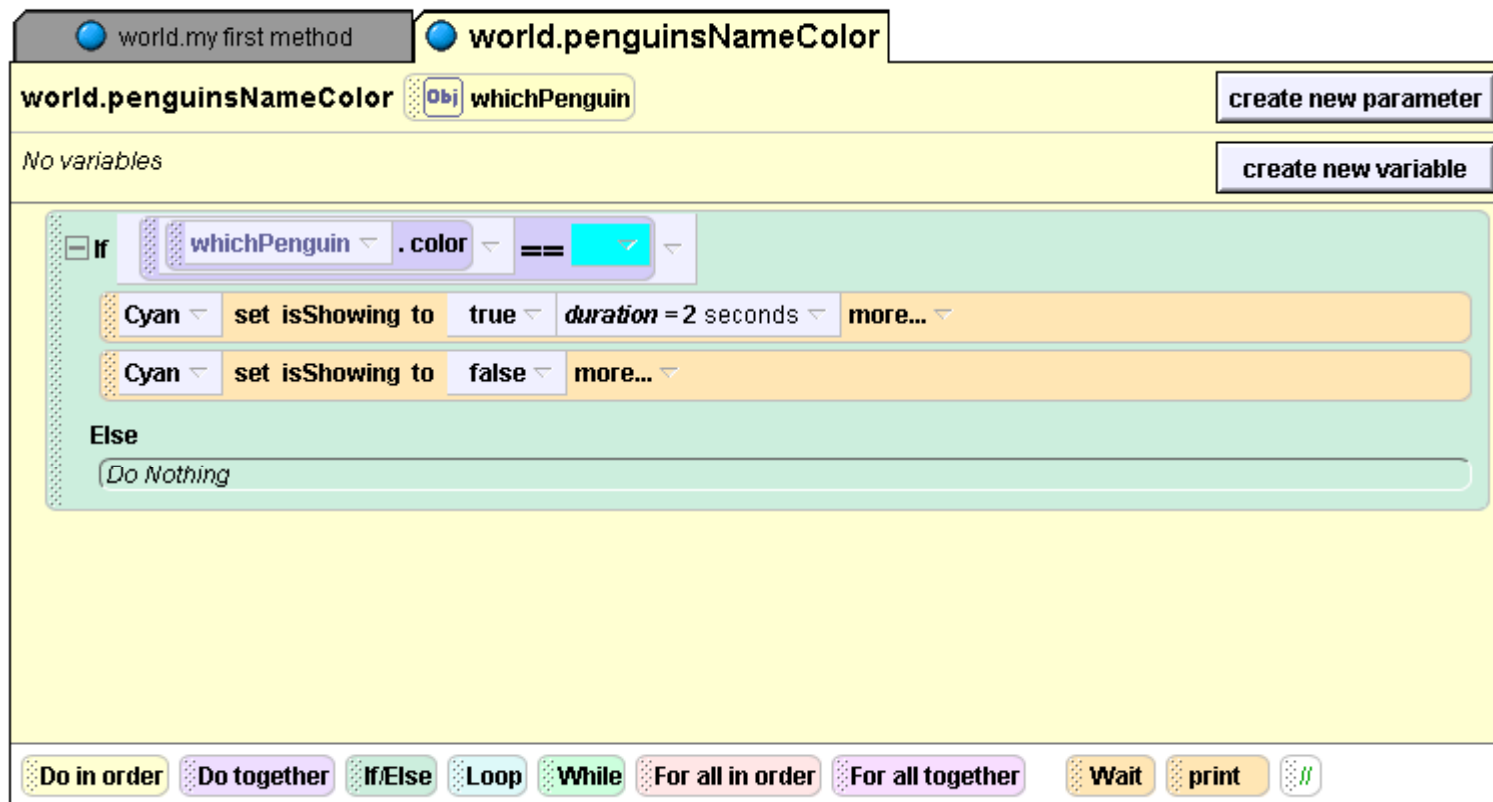
Now we will write a method that tells a word to appear when a penguin turns that color. Create a new world method called **penguinsNameColor**. Give it an object parameter called **whichPenguin**.

Now add an **If Else** statement to your method editor, and set it to **true**. Click **penguin** on the object tree and then go to the **Properties** tab. Click on the **color** button and drag it to your method editor, dropping it over the **true** part of your **If Else** statement. Then choose **penguin.color==**, and when the color menu appears, choose **cyan**. Then, click on your **whichPenguin** parameter and drag it over the **penguin** part of your **If Else** statement. Your code will look like this:



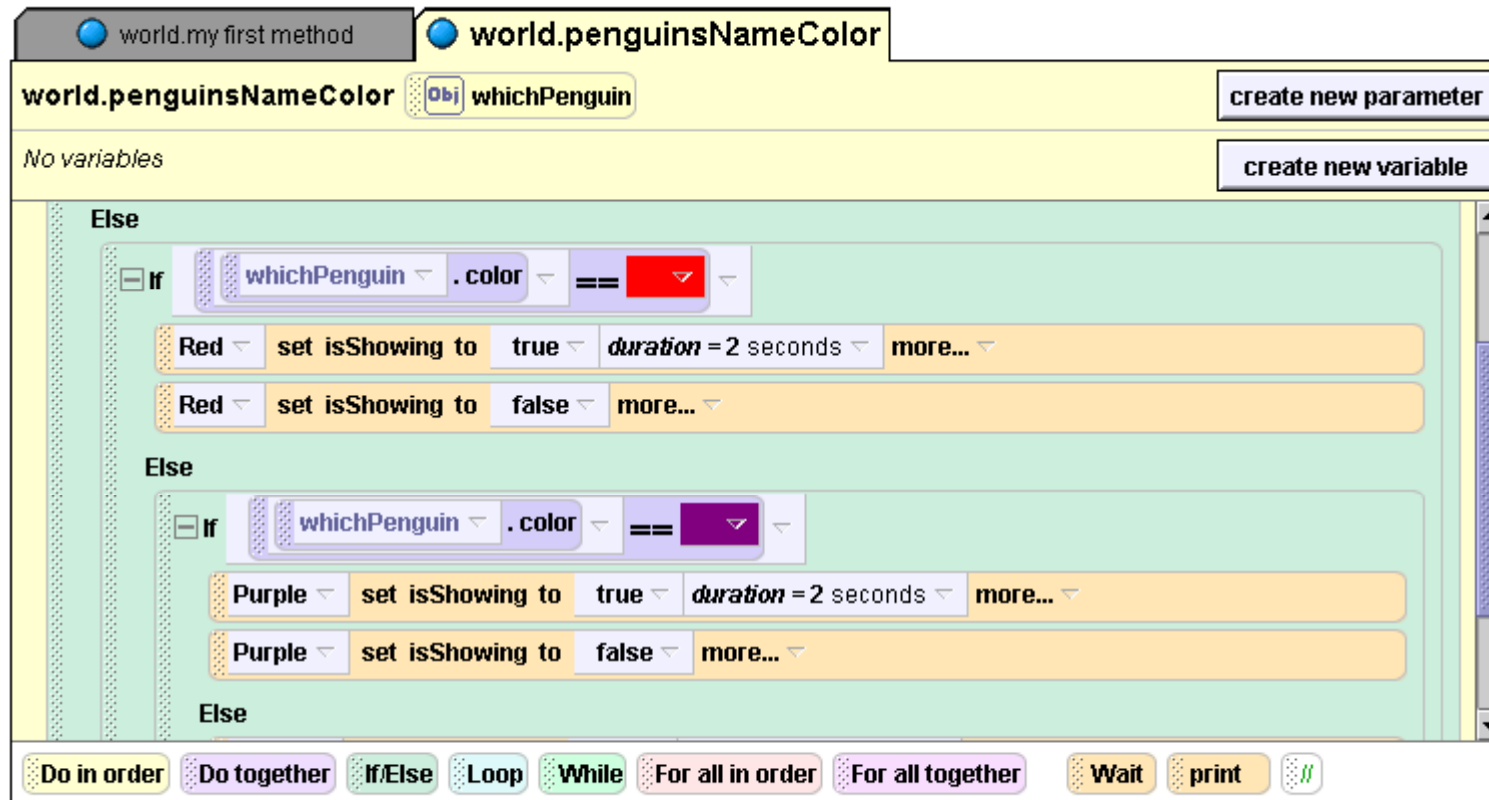
Step 3: cont.

Now we want to make the command tell the word **Cyan** to appear if the penguin turns cyan, and then disappear again after 2 seconds. So click on **Cyan** in your object tree, and then go to the **Properties** tab. Click on the **isShowing** button and drag it under the **If** part of the **If Else** where it says **do nothing**. Drop it there, and click on **true**. Then click on the **more...** part of the command you just added. Click on **duration**, and then **2 seconds**. Then click on the **isShowing** button again, and drag it under the command you just wrote, this time selecting **false**. Your code will look like this:



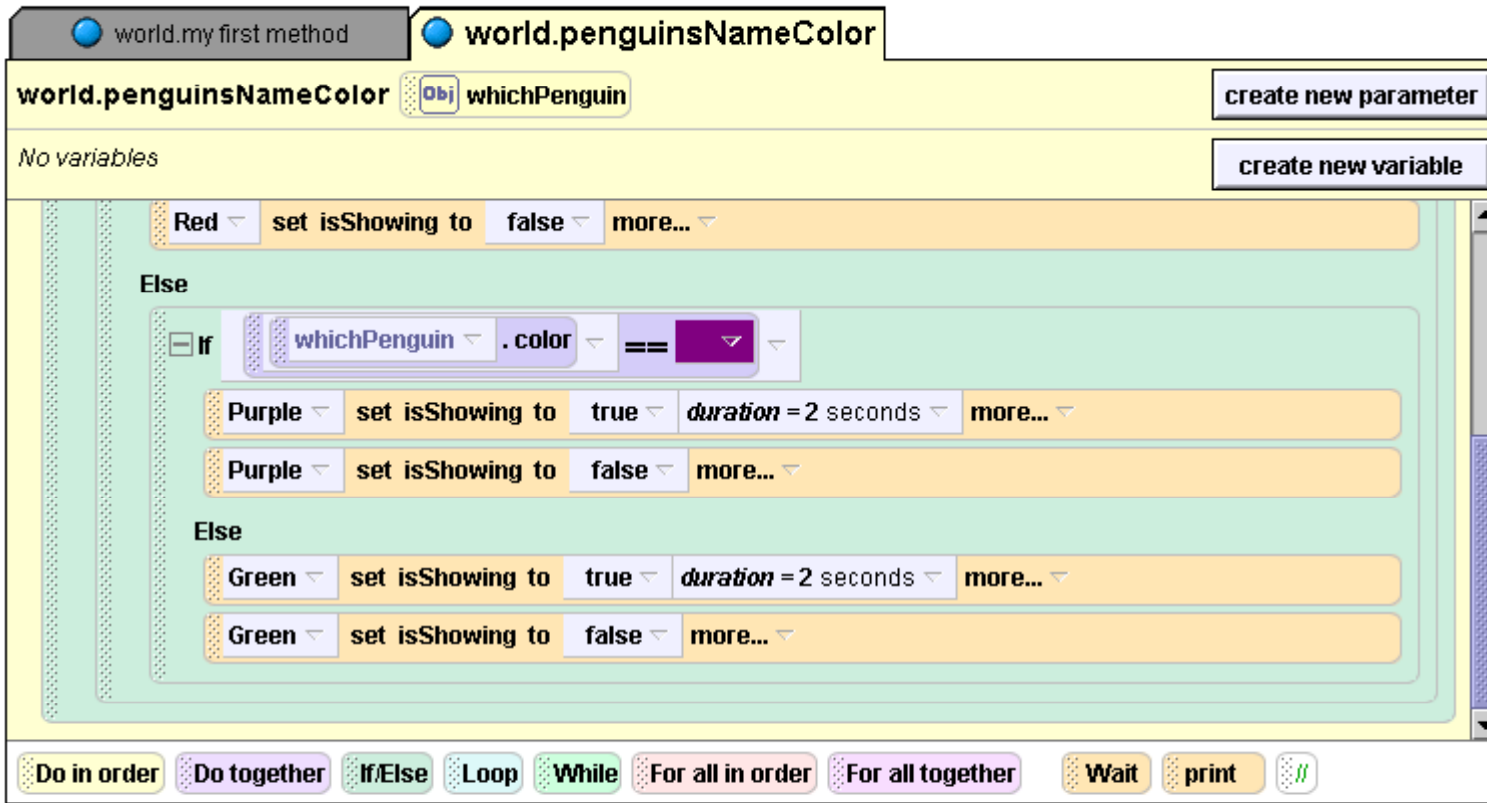
Step 3: cont.

Now we want to tell the other words to appear when the penguins turn their color. So drag another **If Else** statement into your editor, and drop it under the **Else** part of your first **If Else** statement. Now go through the same process with the **Red** text object that you just did with the **Cyan** text object. After that, add *another If Else*, and do the *same* thing with the **Purple** text object. Your code for those two should look like this:



Step 3: cont.

Now let's finish up the code for the **Green** object. Click on the **Green** object on the object tree, go to the **properties** tab, and grab **isShowing**. Drop it under the last **Else** that you have, and set it to **true**. Then change the duration to **2 seconds** like you did with the other text objects. Now drag **isShowing** under that command, and set it to **false**. That code will look like this:



Step 4: Putting it All Together

Now all you have to do is put **penguinsNameColor** into **world.my first method**. Drag it in there four times, and make sure that you alternate each **penguinsChangeColor** with a **penguinsNameColor**. Then set **whichPenguin** to a different penguin each time, going from **penguin** to **penguin4**. Your code will look like this when it's done:

The image shows a Scratch code editor window titled "world.my first method". The method has "No parameters" and "No variables". The code is organized into a "Do in order" loop. The sequence of blocks is as follows:

- Block 1: **world.penguinsChangeColor** with **whichPenguin = penguin**
- Block 2: **world.penguinsNameColor** with **whichPenguin = penguin**
- Block 3: **world.penguinsChangeColor** with **whichPenguin = penguin2**
- Block 4: **world.penguinsNameColor** with **whichPenguin = penguin2**
- Block 5: **world.penguinsChangeColor** with **whichPenguin = penguin3**
- Block 6: **world.penguinsNameColor** with **whichPenguin = penguin3**
- Block 7: **world.penguinsChangeColor** with **whichPenguin = penguin4**
- Block 8: **world.penguinsNameColor** with **whichPenguin = penguin4**

Red circles highlight the **whichPenguin** dropdown menus in each block, showing the progression from **penguin** to **penguin4**. The bottom of the editor shows a palette with various control blocks: "Do in order", "Do together", "If/Else", "Loop", "While", "For all in order", "For all together", "Wait", "print", and a comment block.

Step 4: cont.

Play your world. Each penguin should change colors in turn, and as they change, the appropriate color word will appear in the sky. Try pressing restart; your penguins may be different colors each time it runs! Congratulations! You now know how to use random selection in Alice!

